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Title:

CLIMATE SOLUTION FOR AIR CLEANING AND FRESHENING AND A METHOD  
FOR THE PREPARATION THEREOF ;

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ABSTRACT:

The invention relates to a process for preparing a climate solution for cleaning, freshening and climatizing air. According to the process of the invention a hot saturated or supersaturated aqueous solution of common salt is prepared in the presence of a quartz type clarifying agent, the solution is allowed to cool to room temperature and solids are allowed to settle simultaneously, and then the solution which forms a clear upper phase is separated from the settled solids. The invention also relates to a climate solution prepared as defined above, as well as to a method for cleaning, freshening and climatizing air with this solution.



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/HU96/00016 <b>(22) International Filing Date:</b> 27 March 1996 (27.03.96) <b>(71)(72) Applicant and Inventor:</b> SOMOGYI, István [HU/HU]; Árpád út 140/a, H-1042 Budapest (HU). <b>(74) Agent:</b> JALSOVSZKY, Györgyné; P.O. Box 518, H-1373 Budapest (HU).		<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> CLIMATE SOLUTION FOR AIR CLEANING AND FRESHENING AND A METHOD FOR THE PREPARATION THEREOF  <b>(57) Abstract</b>  The invention relates to a process for preparing a climate solution for cleaning, freshening and climatizing air. According to the process of the invention a hot saturated or supersaturated aqueous solution of common salt is prepared in the presence of a quartz type clarifying agent, the solution is allowed to cool to room temperature and solids are allowed to settle simultaneously, and then the solution which forms a clear upper phase is separated from the settled solids. The invention also relates to a climate solution prepared as defined above, as well as to a method for cleaning, freshening and climatizing air with this solution.		

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CLIMATE SOLUTION FOR AIR CLEANING AND FRESHENING AND A  
METHOD FOR THE PREPARATION THEREOF

The invention relates to a climate solution which can be used to clean, freshen and climate air in a closed space, particularly in a room. The invention also relates to a method for producing said climate solution, as well as to a method for cleaning, freshening and conditioning air in a closed space utilizing the climate solution according to the invention.

It has been observed long before that smoke generated in a closed space, such as in a living room or in a restaurant, can be dispelled or reduced by burning a candle in the room. Heat operated tools, which are the simplest type of air cleaners, has been elaborated on the basis of this observation. The principle of their operation is that they evoke air circulation by heat, whereupon soaring fine solid pollutants deposit from the more cold part of air which streams downfield. Such a tool is disclosed, among others, in Hungarian Patent No. 183,801. However, this reference also discloses that simple air circulation is insufficient to provide an appropriate air cleaning effect.

It has also been observed long before that air can be freshened by evaporating water in a closed space. Based on this observation various liquids for air freshening have been elaborated, of which that disclosed in

Hungarian patent application publication No. 61,206, comprising alcohol, a glycol, water and a perfume, is mentioned as an example. These liquids are generally discharged into air as an aerosol. The very fine droplets of liquid sprayed out in this form supply intensely moisture to air, refreshing thereby air in the space treated, and at the same time the soaring fine solids deposit on the surface of the droplets, whereby air cleaning occurs, too. The air cleaning and refreshing effects of sprayed water clouds is disclosed in Hungarian Patent No. 201 816. These methods have, however, the disadvantage that the air cleaning and refreshing effects get lost within a short time after spraying, or, when the liquid has not been sprayed out, only a minor refreshment of air occurs without any simultaneous air cleaning.

Sorbent compositions with great specific surface area, frequently impregnated with a perfume, have been elaborated primarily to remove unpleasant odourants from air. Sorbent compositions with great specific surface area, comprising silicate type molecular sieves, have been disclosed e.g. in Hungarian Patents Nos. 206,456 and 180,470, whereas according to the method disclosed in Hungarian Patent No. 192,596 pelleted compost is applied as sorbent. Although when used in a small space with adequate air circulation (such as in the inside of a car or of a refrigerator) these compositions eliminate or at

least suppress any unpleasant odour for a relatively long period of time, they do not exert any air freshening effect. Deodourizing compositions of this type exert an adequate air cleaning effect in a bigger space (such as in a living room or in a classroom) only when an appropriate air circulation is also provided for. For this purpose, as disclosed in Hungarian Patent No. 183,801, an air cleaning filter comprising a filter substance with great specific surface area is coupled with means for effecting air circulation, such as with an incandescent lamp causing air circulation by heat. The same reference also discloses a method in which soaring pollutants are separated from circulating air with an ioniser. A particular advantage of this latter method is that air is not only cleaned but refreshed, too, it is, however, a disadvantage that two mechanical means (i.e. an air circulator and an ioniser unit) should be applied simultaneously.

All of the above tools and compositions are common in that they provide health protecting effect only indirectly, by removing soiling solid pollutants and/or some irritative odourants, or, with air fresheners, by providing for an air humidity causing pleasant feeling, and they do not have any health improving or health recovering effect. As far as perfumed compositions are concerned, the presence of the perfume itself may also be a source of disadvantages, which, depending on individual

sensitivity, may be sometimes unpleasant or even irritative, primarily for ones suffering from respiratory diseases.

The invention aims at elaborating a composition which

- is free of the disadvantages of the known ones,
- enables one to clean, freshen and climate simultaneously air even in a relatively large space (such as in a living room, classroom or conference room) without requiring any mechanical means,
- has a long-lasting effect,
- does not contain any potentially irritative odourant,
- provides health protecting effects for healthy persons, and
- provides health improving or sometimes even health recovering effects for ones suffering from respiratory diseases.

Thus, in one aspect, the invention relates to a process for preparing a climate solution for cleaning, freshening and climatizing air. According to the process of the invention a hot saturated or supersaturated aqueous solution of common salt is prepared in the presence of a quartz type clarifying agent, the solution is allowed to cool to room temperature and solids are allowed to settle simultaneously, and then the solution which forms a clear upper phase is separated from the settled solids.

The invention also relates to a climate solution for air cleaning prepared as described above.

In a further aspect, the invention relates to a method for cleaning, freshening and climatizing air in a closed space. According to this aspect, a climate solution according to the invention is allowed to stand in air in an open vessel in said closed space.

When the climate solution according to the invention is poured into an open vessel (such as into a dish or bowl) and is allowed to stand in air, crystals start to deposit on the edges of the vessel within a short time. Initially, very fine crystal needles form in an abundant amount around the edges of the vessel. With the progress of the evaporation of the solvent, a cauliflower-like foamy, highly porous secondary deposit forms from the primary crystal needles, which secondary deposit runs over the edges of the vessel. On the surface of this secondary deposit fine crystal needles continue to form in an abundant amount until solution is present in the vessel. When the evaporated amount of the climate solution is supplemented by fresh solution, this process continues.

Taking into account this evaporation process, the climate solution according to the invention, if not intended to be used immediately, should be protected from evaporation during storage e.g. it should be stored in a hermetically sealed vessel.



When the climate solution according to the invention is placed in a closed space (such as in a living room) in an open vessel and is allowed there to evaporate, a well observable change occurs in the climate of the room within a short time. A fresh, slightly salty climate, resembling seashore climate, forms in the room, which evokes a very pleasant comfort for those staying there. No or only a negligible amount of dust deposits on the furniture even when the room is left uncleaned for a prolonged period of time, which well indicates that there is also a drastic decrease in the amount of soaring solid pollutants. No tobacco smoke can be observed in the air even after a great amount of cigarette has been smoked in the room.

The most favourable effect of the climate solution is that it causes a clinically verified recovery on patients suffering from various respiratory disorders and diseases. Medical observations have shown that medication of several patients could be decreased drastically or could even be stopped.

Although I do not wish to bound my invention to certain theoretical considerations, I assume that the effects discussed above can be traced back to the specific structures of the primary salt crystals and of the secondary salt deposit formed from them. The primarily formed fine crystal needles, which continue to form on the

surface of the secondary salt deposit, continuously supply an abundant amount of ions into the air, presumably as a result of peak effect. These ions, on one hand, separate the soaring solid pollutants (such as dust, soot, etc.) from the air, and, on the other hand, when inspired with air, exert beneficial physiological effects resembling to those exerted by a salty seashore climate. The foamy, very porous salt deposit is an excellent adsorbent for the pollutants deposited from the air.

I have performed some comparative tests in order to determine whether and how the method of preparing the salt solution influences the resulting effects. My tests and observations are discussed below.

In each of the tests 6 l of a test liquid, poured into an open round dish of 30 cm diameter, was placed into a living room of 12 m<sup>2</sup> area and 3 m height. The observations were continued for 2 weeks. The following liquids were used for comparison purposes:

a) Neat tap water, plus commercially available common salt spread on a separate tray.

b) A salt solution saturated at room temperature, prepared by dissolving the salt deposit separated from the climate solution according to the invention in water at room temperature.

c) An aqueous common salt solution saturated when hot, which was allowed to cool to room temperature in the open dish.

No climatizing and/or air cleaning effect could be observed with liquids a) and b). The furniture had to be dusted on every second day, just like before placing out the liquid (and optionally the solid salt). After smoking of 5 to 10 cigarettes the room got so heavily filled with smoke that, according to the opinion of an independent observer appointed for this purpose, fresh air should immediately let into the room. Those who stayed in the room some hours a day considered the conditions of the air in the room as a "like in an average town". No change occurred in the comfort circumstances of a heavy smoker who had slept in the room for two weeks. After evaporation, a salt deposit formed from solution b) on the bottom of the dish, where, however, no crystal needles could be found.

From solution c) crystals started to separate relatively quickly, the crystals were, however, not needle-like. The furniture had to be dusted on every third day in average. According to the opinion of an independent observer appointed for this purpose, fresh air had to be let into the room after smoking 10-12 cigarettes in average. Those who stayed in the room some hours a day did not make any remark in connection with the conditions of

the air. A heavy smoker who had slept in the room for 2 weeks made the only remark in connection with his comfort circumstances at the end of the second week that maybe he had less caughs in the morning.

On the contrary, when a dish with the same dimensions filled with 6 litres of the climate solution according to the invention was placed into the same room, the following could be observed: The independent observer appointed for this purpose did not feel the air smoky even after smoking of 25-30 cigarettes. The furniture had to be dusted only on the 12th day. Those who stayed some hours a day in the room regarded the air, even under heavy smoking, as markedly pleasant and fresh, resembling to a salty seashore climate. According to the observations of a heavy smoker who had slept in the room for 2 weeks his morning coughs, characteristic of smokers, gradually decreased, and practically ceased at the end of the second week. During the observation period fine crystal needles as described above and a foam-like porous salt deposit separated from the solution in the room.

These observations lead to the conclusion that neither the hot saturation of the solution nor the use of a clarifying agent can be omitted in order to attain an appropriate air cleaning, air freshening and climatizing effect.

As quartz type clarifying agent any fine quartz material can be used, of which glass sand, river sand, quartz sand and quartz flour are mentioned as characteristic examples. These substances can also be used in combination. Preferably 0.05-0.2 kg of a quartz type clarifying agent is used to prepare 10 litres of a climate solution.

As common salt (NaCl) any of the commercially available types of salt for household (cooking) or industrial purpose can be applied. I have observed that the use of very fine grained, highly vacuum-refined grades of cooking salt lead to less favourable results than those attainable with more coarse and/or more contaminated types, such as with industrial grade common salt types. This indicates that the impurities present, like the clarifying agent, facilitate the formation of the required fine crystal needles.

Most simply and preferably tap water can be used as water. My tests performed with various mineral water types and with supplemented tap water indicate that the further solutes present in water do not exert an essential influence on the formation of crystal needles, they effect, however, the structure of the secondary salt deposit. The more alkaline is the water used as solvent, the more crumbly is the secondary salt deposit running over the edge of the vessel.

The following example serves to illustrate the preparation of the climate solution.

Example

14 kg of a "Salinen" grade, vacuum-refined and iodined salt for cooking (produced by Salinen, Austria), or 13 kg of an "Asztali só" (table salt) grade, non-refined salt for cooking (produced by Compack Douwe Egbert Rt, Budapest) were added under constant stirring to 40 l of boiling water containing 0.1 kg of quartz flour and 0.3 kg of glass sand. The resulting suspension was boiled for 15 minutes, then it was allowed to stand. After 15 to 20 hours, when the upper liquid phase had already clearly separated from the solids, the clear upper phase was decanted, and stored in a hermetically closed vessel until use.

What I claim is:

1. A climate solution for cleaning, freshening and climatizing air, *characterised* in that it is prepared according to any of claims 2 to 6.

2. A process for preparing a climate solution for cleaning, freshening and climatizing air, *characterised* in that a hot saturated or supersaturated aqueous solution of common salt is prepared in the presence of a quartz type clarifying agent, the solution is allowed to cool to room temperature and solids are allowed to settle simultaneously, and then the solution which forms a clear upper phase is separated from the settled solids.

3. A process as claimed in claim 2, *characterised* in that the quartz type clarifying agent is glass sand, quartz sand, quartz flour or a combination of these materials.

4. A process as claimed in claim 2 or 3, *characterised* in that 0.05 to 0.2 kg of a quartz type clarifying agent is used for 10 litres of solution.

5. A process as claimed in any of claims 2 to 4, *characterised* in that the common salt is added to boiling water already containing the quartz type clarifying agent.

6. A process as claimed in any of claims 2 to 4, *characterised* in that both the common salt and the quartz type clarifying agent are added to boiling water.

7. A method for cleaning, freshening and climatizing air in a closed space, characterised in that a climate solution as claimed in claim 1 is allowed to stand in air in an open vessel in said closed space.



A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 A61L9/01

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 A61L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO,A,90 04960 (KING MICHAEL L) 17 May 1990 see claims; examples ---	1-7
A	FR,A,2 603 806 (RECH BIEN ETRE SA) 18 March 1988 see claims -----	1-7

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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